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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,350	08/04/2003	John Stephen Smith	03424.P007D	8826

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EXAMINER

MARKHAM, WESLEY D

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 04/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/634,350

Applicant(s)

SMITH ET AL.

Examiner

Wesley D. Markham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/9/05, 1/12/06, and 3/9/06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 29-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-13, 29, 36 and 37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Acknowledgment is made of the responses filed by the applicant on (1) 12/9/2005, in which various arguments were submitted, (2) 1/12/2006, and (3) 3/9/2006, in which a new abstract was submitted and the specification was amended. Claims 1 – 13 and 29 – 37 remain pending in U.S. Application Serial No. 10/634,350, with Claims 1 – 13, 29, 36, and 37 being withdrawn from further consideration by the examiner as being drawn to a non-elected invention. An Office action on the merits follows.

Drawings

2. The drawings (18 sheets) filed by the applicant on 8/4/2003 are acknowledged and approved by the examiner.

Specification

3. The objections to the specification, including the abstract of the disclosure, set forth in paragraphs 4 – 6 of the previous Office action (i.e., the non-final action mailed on 9/6/2005) are withdrawn in light of the applicant's amendment to correct the informalities noted by the examiner.
4. Applicant is reminded of the proper language and format for an abstract of the disclosure. Specifically, the form and legal phraseology often used in patent claims, such as "means" and "said", should be avoided. The abstract should describe the

disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 30 – 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Oda et al. (USPN 3,967,004).
7. Regarding independent **Claim 30**, Oda et al. teaches a method of assembling a structure (i.e., a fiber-reinforced resin compound coating) onto a substrate, the method comprising (1) dispensing a thickening agent of magnesium oxide, calcium oxide, etc. suspended in a liquid polyester resin (i.e., a slurry comprising a fluid and a plurality of elements), and (2) projecting an unsaturated polyester resin (i.e., a second fluid) through a nozzle toward the substrate (Abstract, Figures 1 and 2, Col.2, line 9 – Col.4, line 32). In this case, the oxide thickening agent (Col.3, lines 13 – 32) and/or the filler (Col.2, lines 39 – 41) are the “plurality of elements” in the slurry. As the composite coating material of Oda et al. is sprayed to form a sheet on the substrate (Col.3, line 36 – Col.4, line 32), the entire substrate surface is considered to be a “receptor region” or to comprise “receptor regions”, and the

plurality of elements (i.e., the oxides and fillers) in the composite coating are mated thereto (i.e., are designed to mate with the substrate surface / receptor region(s)).

The plurality of elements perform the function of filling and/or thickening the composition and therefore are "functional elements". Regarding **Claim 31**, both the first and second fluids comprise a liquid polyester resin (i.e., the same solvent) (Abstract, Col.2, lines 9 – 39, Col.3, lines 17 – 32). Regarding **Claim 32**, the second fluid comprises a zinc stearate releasing agent (i.e., a surfactant). Regarding **Claim 33**, all of the fluids are projected toward the substrate surface simultaneously (i.e., the second fluid is projected toward the substrate while the coating is being formed, or in other words, while the plurality of elements mates with receptor regions) (Figures 1 and 2, Col.3, line 46 – Col.4, line 33).

8. Claims 30 – 32, 34, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Van Roeyen (USPN 4,397,325).
9. Regarding independent **Claim 30**, Van Roeyen teaches a method of assembling abrasive particles / grit (i.e., a structure) onto a substrate (Figures 1, 4, 5, and 6A), the method comprising (1) dispensing a slurry comprising a first fluid and a plurality of elements (e.g., abrasive aluminum oxide grits / particles / granules) that are designed to be bonded / anchored to the substrate surface (i.e., designed to mate with receptor region(s) on the substrate) (Col.3, line 55 – Col.4, line 53, Col.6, lines 44 – 47), and (2) projecting a second fluid through a nozzle toward the substrate (Figure 6A, Col.4, lines 54 – 65). The granules function as an abrasive (Col.4, lines 3

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– 11) and therefore are “functional elements”. Regarding **Claim 31**, both fluids comprise the same solvent (Col.4, lines 12 – 42 and 62 – 65). Regarding **Claim 32**, the fluids both comprise an epoxy resin to anchor the particles on the base (i.e., a bonding agent) (Col.4, lines 12 – 65, Col.6, lines 44 – 47). Regarding **Claims 34 and 35**, Van Roeyen also teaches immersing the abrasive coated substrates in a variety of solutions “to clean the aluminum oxide grits” (Figure 6B, Col.5, lines 1 – 30). It is the examiner’s position that such an immersion step(s) would have inherently resulted in the cleaning solution(s) pushing / wiping off loose abrasive particles from the base.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order

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for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Roeyen in view of Dudek et al. (USPN 5,167,989).

13. As an alternative to the reasoning presented above, Van Roeyen teaches all the limitations of **Claims 34 and 35** as set forth above in paragraph 9, except for a method further comprising pushing / wiping the excess of the plurality of elements (i.e., the abrasive particles of Van Roeyen) off the substrate after adhering the elements to the substrate. However, Dudek et al. teaches that, in the art of attaching / bonding particulate coating material to a substrate, the excess particles are removed by wiping, blowing with a gas, etc. after coating (Abstract, Col.1, lines 25 – 29, Col.2, lines 25 – 40, Col.4, lines 10 – 20). Therefore, it would have been obvious to one of ordinary skill in the art to wipe and/or blow off any excess abrasive particles that are not adequately bonded to the substrate of Van Roeyen after the coating processes, thereby ensuring a high quality end-product without loose, insufficiently bonded abrasive grains.

14. Claims 30, 31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (USPN 5,545,291) in view of DiMaio et al. (USPN 5,403,624).

15. Regarding **Claims 30, 31, and 33**, Smith et al. teaches a method of fluidic self assembly (FSA) (i.e., a method of assembling a structure on a substrate), the

method comprising dispensing a slurry comprising a first fluid and a plurality of elements, each of which is designed to mate with a receptor region on the substrate and each of which comprises a functional element (Abstract, Figures 6 – 8, Col.1, lines 10 – 22, Col.3, lines 5 – 34, Col.5, lines 4 – 10, Col.6, lines 29 – 35, Col.7, lines 16 – 62, Col.12, line 50 – Col.13, line 11, Col.14, lines 8 – 10). Smith et al. does not explicitly teach projecting a second fluid through a nozzle toward the substrate.

However, Smith et al. does teach that the slurry is transferred evenly over the substrate surface by pouring, spreading, using a pipet, or using any other type of vessel and/or apparatus capable of evenly transferring the slurry over the top surface (Col.7, lines 40 – 51). DiMaio et al. teaches that a plurality of spray nozzles may be employed in a coating process to provide a more uniform coating and an increased production rate (Col.2, lines 55 – 66). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a plurality of pipets (i.e., “nozzles”) or other nozzles to transfer the slurry of Smith et al. over the top surface of the substrate (instead of using a single pipet) in order to provide more uniform slurry distribution and an increased production rate due to the use of the additional nozzle(s). In using multiple pipets / nozzles in the manner suggested above, “a second fluid” is projected through a nozzle toward the substrate, the first and second fluids comprise the same solvent (i.e., because the slurry dispensed from each nozzle is the same), and the second fluid is projected toward the substrate while the plurality of elements mate with the receptor regions (i.e., because the fluids are simultaneously applied), as required by Claims 30, 31, and 33.

Response to Arguments

16. Applicant's arguments filed on 12/9/2005 have been fully considered but they are not persuasive.
17. Regarding the 35 U.S.C. 102 rejections based on Oda, the applicant argues that Oda does not teach each and every element of the claims. Specifically, the applicant argues that the substrate of Oda does not include any individual receptor region (or opening) as taught by applicant's invention and that each one of the functional element is designed to mate with one individual receptor region. The functional element in applicant's invention is thus shaped so that it can fit or mate complementarily to an opening by self assembly. (1) The applicant argues that there is no such self-assembly into any opening or receptor region on the substrate of Oda. (2) The applicant also argues that the plurality of elements recited in the claims are required to comprise a functional element, for example, active circuitry, while the particles in the mixture of Oda do not possess such functional element characteristic. (3) The applicant also argues that Oda did not teach projecting a second fluid through a nozzle toward the substrate.
18. In response to the applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (e.g., individual receptor regions, the receptor regions being openings, each one of the functional elements is designed to mate with one individual receptor region, complementary shapes between the functional element and the receptor

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region, self-assembly, etc.) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In other words, the applicant's arguments are based on an overly narrow interpretation of the claims. Please note that Office personnel are to give claims their broadest reasonable interpretation (*In re Morris*, 127 F.3d 1048, 1054-1055, 44 USPQ2d 1023, 1027-1028 (Fed. Cir. 1997)). Independent Claim 30 simply requires "dispensing a slurry comprising a first fluid and a plurality of elements, each of which is designed to mate with a receptor region on said substrate and each of which comprises a functional element". In this case, the oxide thickening agent (Col.3, lines 13 – 32) and/or the filler (Col.2, lines 39 – 41) are the "plurality of elements" in the slurry. As the composite coating material of Oda et al. is sprayed to form a sheet on the substrate (Col.3, line 36 – Col.4, line 32), the entire substrate surface is reasonably considered to be a "receptor region" or to comprise "receptor regions", and the plurality of elements (i.e., the oxides and fillers) in the composite coating are mated thereto. In other words, "a receptor region on said substrate" is broadly but reasonably considered to be any region on a substrate that receives anything. Therefore, whatever regions on the substrate receive the coating including the oxides and fillers of Oda are considered to be "a receptor region". As the oxides and fillers are on the substrate after the spraying process, the oxides and fillers are reasonably considered to be "mated" to the substrate. Therefore, since the oxides and fillers are actually on the substrate (i.e., "mated" thereto), they are necessarily

“designed to mate” with the “receptor region(s)” on the substrate. The plurality of elements perform the function of filling and/or thickening the composition and therefore are “functional elements”. Regarding the argument that Oda did not teach projecting a second fluid through a nozzle toward the substrate, the examiner strongly disagrees. Specifically, Oda teaches projecting an unsaturated polyester resin (i.e., a second fluid) through a nozzle toward the substrate in addition to the other components (Col.2, line 18 – Col.3, line 57). Each component is sprayed from a different nozzle (Col.3, lines 46 – 53). As such, Oda does teach projecting a second fluid through a nozzle toward the substrate.

19. Regarding the 35 U.S.C. 102 rejections based on Van Roeyen, the applicant makes similar arguments to those discussed above. The arguments are not convincing for the same reason. Briefly, independent Claim 30 simply requires “dispensing a slurry comprising a first fluid and a plurality of elements, each of which is designed to mate with a receptor region on said substrate and each of which comprises a functional element”. In this case, Van Roeyen teaches dispensing a slurry comprising a first fluid and a plurality of elements (e.g., abrasive aluminum oxide grits / particles / granules) that are designed to be bonded / anchored to the substrate surface (i.e., designed to mate with receptor region(s) on the substrate) (Col.3, line 55 – Col.4, line 53, Col.6, lines 44 – 47), and (2) projecting a second fluid through a nozzle toward the substrate (Figure 6A, Col.4, lines 54 – 65). In other words, the plural abrasive granules “18” are actually mated to the surface of the substrate “14” (see Figure 5, Col.2, line 44 – Col.4, line 47). As such, each of the granules is “designed

to mate with a receptor region on said substrate”, the receptor region being whatever region on the substrate that the granules are mated to. The granules function as an abrasive (Col.4, lines 3 – 11) and therefore are “functional elements”. Regarding the argument that Van Roeyen did not teach projecting a second fluid through a nozzle toward the substrate, the examiner strongly disagrees. Specifically, Van Roeyen teaches that a “second spray coating operation” is performed by spraying a slurry through a second spray gun (i.e., nozzle) (Col.4, lines 54 – 65). As such, Van Roeyen does in fact teach projecting a second fluid through a nozzle toward the substrate.

20. Regarding the 35 U.S.C. 103 rejections based on the combination of Smith et al. and DiMaio et al., the applicant argues that Smith did not teach, suggest, or motivate the need for a second fluid to be dispensed by a nozzle, and even if the two references were combined, they do not meet the claims which require projecting a second fluid in combination with dispensing a first fluid that has the elements.

21. In response, this argument is not convincing. The examiner agrees that Smith alone does not teach using a second fluid to be dispensed by a nozzle. However, Smith et al. does teach that the slurry is transferred evenly over the substrate surface by pouring, spreading, using a pipet, or using any other type of vessel and/or apparatus capable of evenly transferring the slurry over the top surface (Col.7, lines 40 – 51). DiMaio et al. teaches that a plurality of spray nozzles may be employed in a coating process to provide a more uniform coating and an increased production rate (Col.2, lines 55 – 66). This teaching would have motivated one of ordinary skill in the art to

utilize a plurality of pipets (i.e., "nozzles") or other nozzles to transfer the slurry of Smith et al. over the top surface of the substrate (instead of using a single pipet) in order to provide more uniform slurry distribution and an increased production rate due to the use of the additional nozzle(s). Contrary to the applicant's position, by using multiple pipets / nozzles in the manner suggested above, "a second fluid" is projected through a nozzle toward the substrate, the first and second fluids comprise the same solvent (i.e., because the slurry dispensed from each nozzle is the same), and the second fluid is projected toward the substrate while the plurality of elements mate with the receptor regions (i.e., because the fluids are simultaneously applied), as required by Claims 30, 31, and 33.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D. Markham whose telephone number is (571) 272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

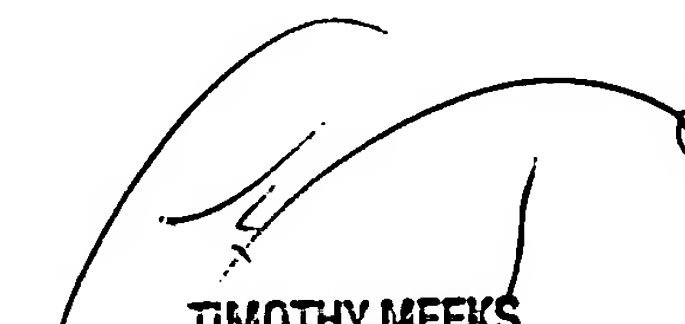
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



WDM

Wesley D Markham
Examiner
Art Unit 1762



TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER